

Claims

What is claimed is:

1. A driver circuit for an optical source, the driver circuit comprising:
 - at least an input stage and an output stage, the output stage being operatively coupled
 - to the input stage; and
 - a current generator circuit adapted to establish a modulation current for application
 - to one of a first output and a second output of the output stage in accordance with a differential input
 - data signal applied to the input stage;
 - the input stage being configured to include first and second differential pairs;
 - the first differential pair having the differential input data signal applied thereto, and
 - being implemented using MOS devices;
 - the second differential pair receiving as its inputs corresponding outputs of the first
 - differential pair, and being implemented using bipolar devices;
 - the first and second differential pairs being configured such that application of the
 - differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair
 - will not exceed a junction reverse bias constraint of the second differential pair.
2. The driver circuit of claim 1 wherein the optical source comprises a laser diode.
3. The driver circuit of claim 1 wherein the output stage comprises a differential pair.
4. The driver circuit of claim 1 wherein the input data signal comprises a single-ended input
- data signal configured for conversion internally to the driver circuit to a differential data signal
- adapted to control application of the modulation current to the first and second outputs of the output
- stage.
5. The driver circuit of claim 1 wherein the first differential pair is configured to provide
- substantially unity gain.

6. The driver circuit of claim 1 wherein the second differential pair is configured to provide a gain greater than unity.

7. The driver circuit of claim 1 wherein the bipolar devices of the second differential pair
5 comprise SiGe bipolar transistors having the reverse bias constraint.

8. An integrated circuit comprising:

at least one driver circuit for an optical source, the driver circuit comprising:

at least an input stage and an output stage, the output stage being operatively coupled

10 to the input stage; and

a current generator circuit adapted to establish a modulation current for application to one of a first output and a second output of the output stage in accordance with a differential input data signal applied to the input stage;

the input stage being configured to include first and second differential pairs;

the first differential pair having the differential input data signal applied thereto, and being implemented using MOS devices;

the second differential pair receiving as its inputs corresponding outputs of the first differential pair, and being implemented using bipolar devices;

the first and second differential pairs being configured such that application of the
20 differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair will not exceed a junction reverse bias constraint of the second differential pair.

9. The integrated circuit of claim 8 wherein the optical source comprises a laser diode.

25 10. The integrated circuit of claim 8 wherein the output stage comprises a differential pair.

11. The integrated circuit of claim 8 wherein the input data signal comprises a single-ended input data signal configured for conversion internally to the driver circuit to a differential data signal

adapted to control application of the modulation current to the first and second outputs of the output stage.

12. The integrated circuit of claim 8 wherein the first differential pair is configured to provide substantially unity gain.

13. The integrated circuit of claim 8 wherein the second differential pair is configured to provide a gain greater than unity.

14. The integrated circuit of claim 8 wherein the bipolar devices of the second differential pair comprise SiGe bipolar transistors having the reverse bias constraint.

15. An apparatus comprising:

- an optical source; and
- a driver circuit coupled to the optical source, the driver circuit comprising:
 - at least an input stage and an output stage, the output stage being operatively coupled to the input stage; and
 - a current generator circuit adapted to establish a modulation current for application to one of a first output and a second output of the output stage in accordance with a differential input data signal applied to the input stage;
 - the input stage being configured to include first and second differential pairs;
 - the first differential pair having the differential input data signal applied thereto, and being implemented using MOS devices;
 - the second differential pair receiving as its inputs corresponding outputs of the first differential pair, and being implemented using bipolar devices;
 - the first and second differential pairs being configured such that application of the differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair will not exceed a junction reverse bias constraint of the second differential pair.

16. A circuit comprising:

at least an input stage and an output stage, the output stage being operatively coupled to the input stage;

the input stage being configured to include first and second differential pairs;

the first differential pair having a differential input data signal applied thereto, and being implemented using MOS devices;

the second differential pair receiving as its inputs corresponding outputs of the first differential pair, and being implemented using bipolar devices;

the first and second differential pairs being configured such that application of the differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair will not exceed a junction reverse bias constraint of the second differential pair.

17. The circuit of claim 16 wherein the circuit comprises a driver circuit for an optical source.

18. The circuit of claim 16 wherein the circuit comprises a limiting amplifier.